

# HERALDO ROZAS

## I. Personal Information

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**Name:** Heraldo Rozas

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**Google scholar:** [scholar.google.com](https://scholar.google.com)

## II. Education

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**Georgia Institute of Technology**

Ph.D. in Ind. Eng.– Systems Informatics and Control

**Atlanta, USA**

*August 2020 - November 2024*

**Universidad de Chile**

M.Sc in Electrical Engineering

**Santiago, Chile**

*April 2019*

**Universidad de Chile**

B.Sc in Electrical Engineering

**Santiago, Chile**

*September 2017*

## III. Educational Experience

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**Teaching assistant**

▷ 3030 - Basic Statistical Methods

*August 2020 - May 2021*

H. Milton Stewart School of Industrial and Systems Engineering

Georgia Institute of Technology

▷ EL3002 Applied Electromagnetism

*March 2016 - July 2016*

Department of Electrical Engineering , Universidad de Chile.

▷ FI2002 Electromagnetism

*August 2016 - December 2016*

Department of Physics, Universidad de Chile.

▷ EL4003 Signals and Systems II

*March 2018 - July 2018*

Department of Electrical Engineering , Universidad de Chile.

**Lab Demonstrator**

▷ EL5205 Advanced Control Laboratory

*August 2017 - December 2017*

Department of Electrical Engineering , Universidad de Chile.

## IV. Professional Experience

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**Graduate Research Assistant**

*August 2020 - Present*

NASA's Habitat Optimized for Missions of Exploration-

Space Technology Research Institute (HOME STRI)

Predictive Analytics & Intelligent Systems (PAIS) Research Group

H. Milton Stewart School of Industrial and Systems Engineering

Georgia Institute of Technology

**Project Engineer**

*April 2019- May 2020*

**Project title:** "Development of an Artificial Intelligence Model for Ion-Lithium Battery Performance Optimization in Electric Vehicles"

Department of Electrical Engineering

Universidad de Chile

**Research Assistant**

*August 2016 - June 2020*

Fault Diagnosis and Failure Prognosis Laboratory

Department of Electrical Engineering

Universidad de Chile.

## V. Research

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### Research Interests

- ▷ Condition-based maintenance for electrical equipment.
- ▷ Data-driven joint optimization of maintenance and spare provisioning for electrical equipment.
- ▷ Data analytics for fault diagnostic and failure prognostics.
- ▷ Decision-making using Stochastic Programming and Distributionally Robust Optimization.
- ▷ Applications: wind turbines, Li-Ion batteries, and electric vehicles.

#### a. List of Journal Publications

1. **Rozas, H.**, Xie, W., and Gebraeel, N., "Data-driven joint optimization of maintenance and spare inventory: A distributionally robust chance-constrained program," *MSOM Informs*, 2023 (*Status: Under Review*).
2. **Rozas, H.**, Basciftci, B., and Gebraeel, N., "Data-driven joint optimization of maintenance and spare parts provisioning for deep space habitats," *Acta Astronautica*, 2023 (*Status: Under Review*).
3. **Rozas, H.**, Xie, W., and Gebraeel, N., "Condition-based maintenance for wind farms using a distributionally robust chance-constrained program," *IEEE Transactions on Power Systems*, 2023 (*Status: Under Review*).
4. Ibrahim, M., **Rozas, H.**, and Gebraeel, N., "An integrated detection-prognostics methodology for components with intermittent faults," *IEEE Transactions on Reliability*, 2023 (*Status: Under Review*).
5. Futalef, J. P., Muñoz-Carpintero, D., **Rozas, H.**, and Orchard, M. E. (2023). An online decision-making strategy for routing of electric vehicle fleets. *Information Sciences*, 625, 715-737. [doi.org/10.1016/j.ins.2022.12.108](https://doi.org/10.1016/j.ins.2022.12.108)
6. Shi, J., **Rozas, H.**, Yildirim, M., and Gebraeel, N. (2023). A stochastic programming model for jointly optimizing maintenance and spare parts inventory for IoT applications. *IIE Transactions*, 55(4), 419-431. [doi.org/10.1080/24725854.2022.2127164](https://doi.org/10.1080/24725854.2022.2127164)
7. Arias-Cazco, D., **Rozas, H.**, Jimenez, D., Orchard, M.E. and Estevez, C., 2022. Unifying criteria for calculating the levelized cost of driving in electro-mobility applications. *World Electric Vehicle Journal*, 13(7), p.119. [doi.org/10.3390/wevj13070119](https://doi.org/10.3390/wevj13070119)
8. **Rozas, H.**, Muñoz-Carpintero, D., Saéz, D., and Orchard, M. E. (2021). Solving in real-time the dynamic and stochastic shortest path problem for electric vehicles by a prognostic decision making strategy. *Expert Systems with Applications*, 184, 115489. [doi.org/10.1016/j.eswa.2021.115489](https://doi.org/10.1016/j.eswa.2021.115489)
9. **Rozas, H.**, Troncoso-Kurtovic, D., Ley, C. P., and Orchard, M. E. (2021). Lithium-ion battery State-of-Latent-Energy (SoLE): A fresh new look to the problem of energy autonomy prognostics in storage systems. *Journal of Energy Storage*, 40, 102735. [doi.org/10.1016/j.est.2021.102735](https://doi.org/10.1016/j.est.2021.102735)
10. Díaz, C., Quintero, V., Pérez, A., Jaramillo, F., Burgos-Mellado, C., **Rozas, H.**, and Cárdenas, R. (2020). Particle-filtering-based prognostics for the state of maximum power available in lithium-ion batteries at electromobility applications. *IEEE Transactions on Vehicular Technology*, 69(7), 7187-7200. [doi.org/10.1109/TVT.2020.2993949](https://doi.org/10.1109/TVT.2020.2993949)
11. **Rozas, H.**, Jaramillo, F., Perez, A., Jimenez, D., Orchard, M., and Medjaher, K. (2019). "A method for the reduction of the computational cost associated with the implementation of particle-filter-based failure prognostic algorithms". *Mechanical Systems and Signal Processing*. [doi.org/10.1016/j.ymssp.2019.106421](https://doi.org/10.1016/j.ymssp.2019.106421)
12. Orchard, M.E., Muñoz-Poblete, C., Huircan, J.I., Galeas, P. and **Rozas, H.**. (2019). "Harvest Stage Recognition and Potential Fruit Damage Indicator for Berries Based on Hidden Markov Models and the Viterbi Algorithm". *Sensors* . [doi.org/10.3390/s19204421](https://doi.org/10.3390/s19204421)

## **b. List of Conference Publications**

1. Perez, A., **Rozas, H.**, Jaramillo, F., Quintero, V., and Orchard, M., "A Simulation Engine for the Characterization of Capacity Degradation Processes in Lithium-ion Batteries Undergoing Heterogeneous Operating Conditions", PHM CONF, 2019. [doi.org/10.36001/phmconf.2019.v11i1.855](https://doi.org/10.36001/phmconf.2019.v11i1.855)
2. **Rozas, H.**, Munoz-Carpintero, D., Perez, A., Medjaher, K., and Orchard, M., "An Approach to Prognosis-Decision-Making for Route Calculation of an Electric Vehicle Considering Stochastic Traffic Information", Fourth European Conference of the Prognostics and Health Management society, 2018. [doi.org/10.36001/phme.2018.v4i1.440](https://doi.org/10.36001/phme.2018.v4i1.440)
3. **Rozas, H.**, Clavería, R., Medjaher, K., and Orchard, M., "Residual-based scheme for detection and characterization of faults in lithium-ion batteries", 10th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, SAFEPROCESS - 2018. [doi.org/10.1016/j.ifacol.2018.09.578](https://doi.org/10.1016/j.ifacol.2018.09.578)
4. Perez, A., Quintero, V., **Rozas, H.**, Jimenez, D., Jaramillo, F., and Orchard, M., "Lithium-Ion Battery Pack Arrays for Lifespan Enhancement", IEEE ChileCon 2017, October 18th-20th, Pucón, Chile. [doi.org/10.1109/CHILECON.2017.8229537](https://doi.org/10.1109/CHILECON.2017.8229537)
5. Perez, A., Quintero, V., **Rozas, H.**, Jaramillo, F., Moreno, R., and Orchard, M., "Modelling the Degradation Process of Lithium-Ion Batteries when Operating at Erratic State of Charge Swing Ranges", 4th International Conference on Control, Decision and Information Technologies - CoDIT'17, April 5th-7th, 2017, Barcelona, Spain. [doi.org/10.1109/CoDIT.2017.8102703](https://doi.org/10.1109/CoDIT.2017.8102703)

## **c. Conference and Workshop Activities**

1. Session chair-"Optimization in Quality and Reliability", IISE 2023, New Orleans, USA.
2. Presentation titled: "Joint Optimization of Maintenance Scheduling and Spares Provisioning in Deep Space Habitats", IISE 2023, New Orleans, USA.
3. Poster presenter-"Joint Optimization of Maintenance Scheduling and Spares Provisioning in Deep Space Habitats", SmartHab Workshop, San Antonio, USA.

## **VI. Awards and Recognitions**

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### **Stewart Fellowship (2020)**

▷ Fellowship awarded by Georgia Institute of Technology

### **FULBRIGHT Scholarship (2020-2024)**

▷ International Scholarship to pursue doctoral studies in the US, awarded by FULBRIGHT CHILE.

### **CONICYT - Master's Scholarship (2018)**

▷ National Grant to pursue master studies in Chile, awarded by CONICYT.

### **Distinguished student ( 2014, 2015, 2016, 2017, 2018 )**

▷ Recognition awarded by the Schools of Engineering and Sciences of the Universidad de Chile for achieving outstanding performance while pursuing B.Sc or M.Sc.

## **VII. Additional Skills**

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### **Computing Skills**

▷ **Programming:** Python, Matlab, Simulink.

### **Languages**

▷ English (Fluent), Spanish (Native speaker)

## VIII. Contacts for References

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**Nagi Gebraeel**

*Georgia Power Professor*

School of Industrial and Systems Engineering

Georgia Institute of Technology

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**Marcos Ochoa**

*Professor*

Department of Electrical Engineering

Universidad de Chile

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**Jianjun Shi**

*Carolyn J. Stewart Chair and Professor*

School of Industrial and Systems Engineering

Georgia Institute of Technology

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**Weijun Xie**

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